REMARKS

The specification has been reviewed, and clerical errors of the specification have been amended.

In the Office Action of January 12, 2007, claims 1-9 were rejected under 35 U.S.C 103(a). In response to the office Action, claim 1-4 and 7-9 have been amended, and claim 5 and 6 have been canceled. New claim 10 has been filed.

As recited in claims 1 and 9, the material of the positive electrode of the invention contains certain amounts of magnesium and zirconium ($0.0001 \leqq c \leqq 0.03$, $0.0001 \leqq d \leqq 0.03$). The structure allows to significantly enhance the reaction of zirconium and also avoid zirconium to exist as oxide as it is, as stated on page 5, lines 11-20 of the specification.

As a result, under a high voltage (over 4.4V, specifically, charging voltage is 4.5V when a metallic lithium is used), charge-discharge cycle durability is increased. Furthermore, a charging capacity of about 185 to 190 mAh can be achieved for 1 g of $LiCoO_2$. On the contrary, a positive electrode material which is designed to be used conventionally under a low voltage (under 4.4V) is violently deteriorated, and cycle durability is also unsatisfactory, as disclosed on page 1, line 24 to page 2, line 4, and page 2, lines 22-26 of the specification.

With respect to the rejection based on Hosoya, it discloses only a lithium transition metal composite oxide, represented by the general formula $LiCo_xA_yb_zO_2$ and suggests Al, Cr, V, Mn and Fe for A and Mg and Ca for B ($0.9 \leqq x < 1$, $0.001 \leqq y \leqq 0.05$, $0.001 \leqq z \leqq 0.05$). Specifically, Hosoya shows Al and Mg, Cr and Mg, Al and Ca, V and Mg, Mn and Mg, and Fe and Mg as combinations for A and B respectively. Hosoya does not disclose or imply a specific combination of Mg and Zn as shown in the present invention. Furthermore, Hosoya does not disclose or imply that it is intended

to improve a cycle durability under a high voltage, such as 4.5V, which is a primary objective of the present invention.

As to the rejection based on Biensan, Biensan discloses an electro-chemically active material with general formula, $LiCo_xA_yB_zO_2$ ($0.8 \leqq x \leqq 1.2$, $0.8 \leqq t \leqq 4.2$, $(0.8-m-z) \leqq y \leqq (2.2-m-z)$, $0 \leqq z \leqq 0.3$, $0 \leqq m \leqq 0.3$). M represents at least one transition metal selected from nickel, cobalt, manganese, and iron. A represents magnesium and calcium. D represents at least one element selected from the elements of groups 4b to 5b of the periodic classification. D is preferably at least one metal selected from titanium, zirconium, vanadium, chromium, molybdenum, copper, zinc, cadmium, aluminum, gallium, and tin. Biensan specifically focuses on Ni, Mg and Ti and Ni, Mg and Sn as combinations of M, A and D respectively.

Also, Biensan exemplifies only two compositions of $Li_xNi_{0.90}Mg_{0.05}Ti_{0.05}$ and $Li_xNi_{0.90}Mg_{0.05}Sn_{0.05}$. It is assumed that it is intended to show $Li_xNi_{0.90}Mg_{0.05}Ti_{0.05}$ rather than $Li_xNi_{0.95}Mg_{0.05}Ti_{0.05}$ as mistakenly shown in column 4, line 25. Also, it should be mentioned that all examples in Biensan are based on nickel positive electrode materials.

As shown in the invention, effects as a result of adding specific metal elements to cobalt are substantially different, depending on which positive materials are used. For example, the invention shows that the primary objective cannot be achieved when a large amount of metal elements is added to the cobalt positive electrode material. As shown in Example 1 and comparative Example 8 of the invention, it is clear that a large capacity and excellent cycle characteristics cannot be obtained unless quantities of metal elements are just right.

Furthermore, Biensan does not disclose or imply that it is intended to improve cycle durabilities under a high voltage, such as 4.5V, which is a primary objective of the present invention.

Basically, Biensan discloses only improvements of cycle durabilities and characteristics under a particular condition of a low voltage, 4.1V.

As to the rejection based on the combination of Hosoya and Biensan, even combination of the cited references, Hosoya and Biensan cannot make the invention obvious to one of ordinary skill in the art at the time the invention was made on the grounds that the both cited references do not disclose a combination of Mg and Zr.

According to the present invention, in Summary Table of examples and comparative Examples, a combination of Mg and Zr shows the best characteristics among other combinations. The cited references do not disclose or imply the combination of Mg and Zr, nor a problem regarding capacity and cycle characteristics under a high voltage range. It would be highly unrealistic to come up with an idea that a combination of Mg and Zr can improve an effect of Zr in order to increase capacity and cycle characteristics under a high voltage range unless the inventors were aware of the problem.

Furthermore, effects as a result of adding specific metal elements are substantially different, depending on which positive materials are used, as compared the Comparative Example 8 to the nickel positive electrode material in Biensan.

Namely, Hosoya and Biensan do not disclose or suggest that the reactivity of Zr is improved by adding Mg, and Zr does not exist as single oxide, so that the cycle characteristic under the high voltage range and charge capacity are improved. Therefore, even if Hosoya and Biensan are combined, it is not obvious that the reactivity of Zr is improved by using the combination of Mg and Zr, thereby improving the cycle characteristics and charge capacity.

The cobalt positive electrode material is different from the nickel positive electrode material in the reaction of the increase and decrease of the amount of addition of the metal materials and

the increase and decrease of the charge capacity. Cobalt positive electrode material shows that the more the metal elements are added, the smaller the capacity becomes. On the contrary, the nickel positive electrode material shows no such decrease as to the capacity. Therefore, even if Biensan showing the nickel positive electrode material is referred to, it is not possible to apply the content of Biensan to the cobalt positive electrode material of Hosoya.

In the cobalt positive electrode material, the best result is obtained by adding a small amount of Mg and Zr. This combination is not suggested in the cited references. The wide variations of experiments are required to find the best combination for the cobalt positive electrode material with small quantities of Mg and Zr among other candidates. Therefore, claim 1 is patentable over the cited references.

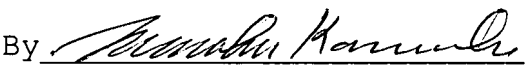
In claim 10, F is positively added in the above positive electrode material. Hosoya and Biensan do not contain F. Therefore, claim 10 is patentable over the cited references.

As explained above, claims pending in the application are patentable over the cited references.

Reconsideration and allowance are earnestly solicited.

One month extension of time is hereby requested. A credit card authorization form in the amount of $120.00 is attached herewith for the one month extension of time.

Respectfully Submitted,

By 

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